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AUSTRALIAN ECONOMIC PROBLEMS. I. THE RAILWAYS.¹

SUMMARY.

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¹BIBLIOGRAPHICAL NOTE.—The only scientific study of early Australian railway policies known to the writer is Doctor Moritz Kandt's *Ueber die Entwicklung der Australischen Eisenbahnpolitik* (Berlin, 1904), which gives a history of railway development and administration in Victoria until government ownership was fully established. The best descriptive and statistical account of Australian railways, their finances and operation, is in T. A. Coghlan's *Australia and New Zealand* (Sydney, Government Printing Office, 1904). Coghlan gives the most reliable comparative statistics. The Report of the New South Wales Commissioner of Railways for 1866 contains a history of the origin and progress of railways in that colony. The various colonial year books and railway department reports have afforded all the other statistics quoted. Data as to recent rates are from the published rate books of New South Wales, Victoria, and South Australia. Parliamentary acts, reports, and debates throw light upon railway history and policies. Interstate competition was discussed fully in the federal convention and the debates of that body and the papers laid before it by state officers give a satisfactory view of the question up to the time federation was accomplished. For later details the federal Hansard should be consulted. The account of Australian railway operations most accessible to Americans is to be found in Professor Hugo Meyer's *Government Regulation of Railway Rates*. But this account, tho accurate in most of its details, omits so much that is essential for an understanding of real conditions in Australia as to be but a partial and rather one-sided presentation of the subject, and therefore open to the charge of bias in its conclusions.

This paper, and others to follow, give the substance of lectures delivered at Harvard University.

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I. EARLY HISTORY; ORIGIN OF PUBLIC OWNERSHIP.

AUSTRALIAN railways are interesting to Americans chiefly as illustrating government ownership. In 1904, of over 14,000 miles of line in the Commonwealth, but 640 miles, or less than $4\frac{1}{2}$ per cent., were owned by private companies. But, before viewing the railways in this relation, we need to note important differences between transportation conditions in Australia and the United States.

In America the great freight-producing regions and the center of population lie far from the coast. Our best agricultural land is in the interior, and our great mineral regions are far from tide-water. Our rural population, as compared with that of Australia, is evenly distributed; our seaports are numerous; our inland waterways are abundant and open for long seasons. In Australia, on the other hand, the arable land lies near the coast, while the interior is arid. The coal districts are near a seaport. There are few natural harbors. No great lakes and but a single river system compete with railways. Through traffic between the great centers of population is coastwise, and meets ocean competition. The eastern and western seaboard of the continent are connected by a shorter water route than we should have possessed, had the Panama Canal been open from the founding of the Republic.

Therefore, Australian railways, as compared with those of America, have few long hauls and little back loading. All their traffic originates along their own course. There is water competition with coastwise lines, and little such competition with those leading to the interior. Settlement thins out rapidly as one leaves the coast, with a corresponding diminution of freight density and passenger traffic. Urban population is concentrated at a few large ports. Grazing, not agriculture, is the leading industry. Copper and lead are the only industrial metals mined; and, tho gold and silver are produced in large quantities, they afford directly but little freight. These conditions make railways naturally less remunerative in Australia than in the United States. The problem of establishing profitable systems, extended enough to tap the scattered resources of the country, is more difficult to solve.

Notwithstanding these differences, Australia, like the United States, has had to build long railways through new and sparsely settled country, to make railways subservient to land development, to borrow capital for these enterprises abroad, and to meet engineering difficulties without the local, mechanical, and technical equipment of long-established industrial communities. These circumstances compelled Australia, like our own country, to build railways with public aid. Australians, also, have had to meet the issue of public control of transportation by a popular government. Therefore, while many conditions were different, the railway problems of Australia were at first practically the same as our own and for this reason peculiar interest attaches to its different way of solving them. In America public enterprise has competed with private enterprise in railway building, and it might have been predicted that we should follow the example of New York, with its great canal, and retain

these works in government hands. In Australia the first railways were private undertakings, and opinion hesitated for a time between public and private ownership. The survival of private railways in America and of government railways in Australia was in each case determined by local conditions rather than by a definite policy on the part of the people or the government.

The first projects for railways in Australia started in England during the decade ending with 1850. The country was still a sheep ranch. Gold had not been discovered, and agriculture was hampered by want of a market. The Suez Canal had not been built, steam navigation was in its infancy, and the colonies were still six months' voyage from the mother country. These projects stimulated agitation for railways in Australia itself. The home government, which retained a strict tutelage over the colonies, became interested, and in 1846 Gladstone sent a circular letter to the governors, advising a uniform railway policy in the Australian possessions, based upon British experience. Among his recommendations were two, generally adopted in Australia, that looked toward definite government control. One was that the public authorities should have power to regulate rates, the other that they should have the privilege of buying the railways at an appraised valuation.

About 1850 New South Wales, Victoria, and South Australia, under laws taken without change or adapted from those of Great Britain, chartered private companies to build short lines out of the metropolis of each colony. The colonists wished to use public lands, which were still controlled by the home authorities, to promote these enterprises. But the Imperial Government steadfastly set its face against this policy. The only concession promised was that railways might buy lands along their right of way at the upset price for which they were offered

at auction. In 1841 this price had been fixed at £1 an acre.

This land policy was probably the decisive influence that turned Australia to government ownership. If crown lands could have been granted to railways, private capital to build them might have been secured from England, and the history of these enterprises would have been the same as in the United States. Because they could not grant land, the colonial authorities had to give the railways other assistance. As private capital in Australia was earning from 20 to 50 per cent. in land and mine speculation, it could not be diverted to less remunerative railway enterprises. English capitalists were not ready to lend money in the colonies to private undertakings of so experimental a character. The distance was too great, the conditions under which investments were made too uncertain. Therefore, the government, pushed on by popular clamor for railway conveniences, subscribed directly for a large share of the stock of private railway companies or made them loans secured by a mortgage on their property. It also guaranteed interest or dividends to private investors. No early railway was undertaken without one or more of these forms of public support.

The companies thus fostered were not successful. In Victoria, the colony most active in railway enterprise, the largest project, the Melbourne and Mount Alexandria railway, never reached the construction stage; and the Geelong railway, which was not completed until 1857, was practically bankrupt when taken over by the government three years later. These failures were due partly to the fact that railways were still experiments, partly to the necessarily high cost of construction, which exhausted their capital. In South Australia and Queensland the private companies did not begin actual work; hence, in

order to provide needed facilities, the government had to build the lines. The final result was the same in all the colonies: the public, impatient for railway conveniences, forced the government to supply them.

The first intention of the authorities was to build the railways, and, when completed, to lease them for operation to private contractors. In Victoria this was recommended by a royal commission in 1854; and three years later the parliamentary railway committee reported: "Under the present circumstances of the country the State must necessarily be entrusted with the formation of the main lines of railway. . . . The management and working of the lines of railway after completion ought not to remain in the hands of the government." In New South Wales the government, after taking over from a private company the first railway built in that colony,—a suburban line fourteen miles long, from Sydney to Paramatta,—leased it to a contractor. The same colony experimented at one time with leasing passenger and freight traffic to different undertakers.

Bad government management in Victoria caused such dissatisfaction that during the early sixties a popular demand arose to place the roads in private hands. In 1863 there were but two parties in parliament, those who wanted to sell outright and those who still had faith in the leasing policy. The latter secured a law providing that the government lines be rented for seven years to the highest bidder. The government delayed putting the act in force, ostensibly in order to get information and sample contracts from Europe, where the same system had been adopted. Meantime a body of employees and others interested in government management became influential with the ministry, and ultimately with parliament. As early as 1865 there was a party in favor of government operation, which secured accessions from

members representing districts seeking new lines. By 1867 the improved financial condition of the colony and the demand for railway extension, together with more satisfactory service as the government acquired experience in railway management, changed popular sentiment in favor of government operation, and the agitation for leasing died out.

Western Australia affords an exception to the rule that railways were not built by land grants. In 1878, when the first line was constructed in that colony, it had less than 30,000 inhabitants, occupying a territory of nearly a million square miles. Parliamentary government had not been established, and conditions were unfavorable for public loans. But the colony had vast assets of crown land. Consequently, in the lack of public funds, land was granted private companies to build two trunk lines, running from the Swan River district, where Perth, the capital and chief city, is located, south and north respectively to Albany and Geraldton. The lines were both built, and one of them still remains in private hands. The other and more important road, from Perth to Albany, has been resumed by the government, principally because the railway company would not open its land for settlement.

In 1892, after the state railway system was well established, Queensland passed an act permitting the government to grant land to private companies for the construction of railways under one of three conditions: (1) the railway to become the property of the government without compensation at the end of a term not exceeding fifty years; (2) or the railway to become the property of the government as soon as completed; (3) or the railway to remain private property, subject to right of purchase by the government on appraisalment, under conditions stipulated in the contract between the railway depart-

ment and the builders. In the first case public land along the proposed line may be granted, at a price estimated without including the increase of value due to the railway, to the amount of twice the cost of construction. In the second and third case the value of the land that may be granted is to equal the cost of construction. If operated by a private company, railways built under these conditions must maintain continuous service with the government railways. A line cannot be sold or leased by the original company without the consent of the government. The public authorities reserve the right to lower rates, but not below a minimum of four cents a mile for passengers and six cents per ton a mile for freight. The company is forbidden to discriminate in rates or services between patrons of the road.

The Australian governments undertook the construction of railways more readily because from the days of convict labor they had built the principal highways and bridges. A central road board was in charge of this work in each colony. The government also appointed officers to represent it on the directorate of private railways, in which it often owned controlling stock. From these sources it was easy to organize a railway department. Victoria placed her first lines in charge of the commissioner of public works and the surveyor-general, who were the state highway authorities. Later they were placed under a board of lands and works, including the responsible minister and the manager of the lines.

II. ADMINISTRATIVE PROBLEMS; THE COMMISSIONER SYSTEM.

The early essays at public control were far from satisfactory, either to the people or to the government. There was much wasteful expenditure. Lines were built for

political rather than for commercial reasons; stations and sidings which not only brought no profit to the government, but were a source of loss, were established at the call of private interests. Trains stopped so frequently that their schedules were complicated and traffic slow. Trains were put on that did not pay. The service was loaded down with unnecessary employees. It was even charged that construction contracts were manipulated.¹ What we should call secret rebates were granted to favored shippers.² Some of these charges were never proved, but they came up at different times and were probably in the main justified. There is hardly an abuse in American railway administration and traffic arrangements that could not be matched with a similar abuse in the history of Australian railways. But in Australia reforms responding to specific exigencies have been made from time to time, and a body of precedent based upon long experience in government administration established, which now fairly meets most of the early administrative errors.

After the first more or less chaotic organization of public railway departments in Victoria and New South Wales the control and administration of railways was delegated to responsible ministers, who appointed a general manager directly to operate the lines. Under this system many successful railways were built, and a fairly efficient service maintained. But political evils grew up. Favoritism appeared in the various departments, and roads were constructed and employees engaged to pay political debts or to secure political support. So late as 1897 a delegate at the federal convention felt justified in saying "the railways of the past seem to have been treated as state machines erected for political purposes rather than as commercial undertakings."

¹ The contractors took away the government's inspectors by paying them higher salaries.

² By means of false bills of lading.

To remedy this evil, in 1885 Victoria placed her railways in the hands of three commissioners appointed by the governor in council under authority of an act of parliament. These commissioners were made fully responsible for the construction, maintenance, and administration of the railways. They could be suspended only on specific charges and removed by parliament itself. In 1887 South Australia, and in the following year New South Wales and Queensland, adopted a similar system. Later Queensland, Victoria, and South Australia reduced the number of commissioners to one. In 1903 Victoria returned to three commissioners a second time. The number of commissioners, however, chiefly affects convenience of administration and has nothing to do with the principle of independent management. At the time this new policy was adopted by the leading Australian colonies, Western Australia did not yet have responsible government, and its railways were administered by a commissioner who was a member of the governor's council. After responsible government was introduced, the commissioner became one of the ministers in parliament, appointing a general manager who directly administered the railways. This system, practically the same as that of the other colonies before commissioners were introduced, proved unsatisfactory, and in 1902 that colony also followed the example of the older states of the Commonwealth. Tasmania still administers her railways in the old way through a general manager appointed by the minister of public works. And New Zealand has returned to the responsible minister system after eight years' experience with commissioners between 1887 and 1895.

In South Australia the railway commissioner reports directly to parliament, in the other states to a minister. The railway minister, where there are independent commissioners, simply directs legislation, and represents the

railway department in parliament. He has no authority to interfere in railway management. In theory, and largely in practise, politics and railway administration are entirely separate. However, the ministry as a whole, as the executive representative of parliament, can veto a commissioner's policy. When the commissioners of three colonies entered an agreement regulating competitive inter-colonial traffic, in 1895, the Victorian government disallowed the act of its commissioner, as affecting interests outside the railways proper.

The independent railway commissioners of each state are a body corporate, in whom its railway property is vested. Their liability for accidents and other claims is limited by law. No commissioner can be dismissed except by parliament, and he can be suspended from his functions only for specific reasons enumerated in the railway law. A commissioner or railway officer participating or claiming to participate in a profit from any transaction relating to the railways is guilty of a misdemeanor.

The railway acts in the different states prescribe the duties of railway commissioners, and regulate with some detail certain items of management. In Western Australia the commissioner is permitted to use any motive power he considers advisable, to facilitate and regulate accident insurance on the railways, and to collect freight for the railways from points off of the lines. In all these respects the state laws are practically uniform. The New South Wales law requires the commissioner to investigate all railway accidents and report to the minister. If the report is not satisfactory, a commission is appointed, consisting of a district judge or other magistrate with assessors, to investigate the accident more thoroughly. The right of the commissioners to regulate freight charges is thus qualified in New South Wales. "No reduction or advance in any such tolls shall be made either directly

or indirectly in favor or against any particular company or person travelling upon or using the railroad."

The commissioners have full control of railway management under the railway law. This includes maintenance and operation, appointment and dismissal of employees, fixing freight and passenger charges, issuing regulations governing traffic, and practically all matters controlled by the directors and managers of American railways. The appointment of employees, except a limited number of casual hands, is governed by a civil service law. Promotions are also regulated by statute, but are flexible enough to assure efficiency. Employees who have been fined, suspended, or dismissed by a superior officer, may appeal to a special board constituted under act of parliament whose decision is final. Where there are three commissioners, they usually constitute this board.

Appropriations for new lines are made by parliament. There is usually a standing committee on railways, to whom all railway projects are referred by the minister responsible for this department with estimates and plans submitted by the commissioners. The committee takes testimony as to the probable cost and profit of the proposed line, its relation to land development, and other matters of public interest. Parliament usually adopts the committee report without important modifications.

III. CONSTRUCTION, MILEAGE, GAGE, DENSITY.

The construction of new lines is sometimes in charge of a distinct department of the government. In Victoria, from 1884 to 1891, the railway commissioners both built and managed the lines, but in 1892 railway construction was transferred to the board of lands and works. About 1900 Western Australia transferred the control of capital

expenditures, previously in the hands of the railway department, to the department of public works; but in 1903 the commissioner of railways was again given authority to build new lines, subject to the approval of the minister. The same system prevails in Queensland.

It is now the policy to make lands increased in value by new railways pay part of the cost of their construction. When the first railway projects were under consideration in Victoria, Governor Hotham proposed a general scheme including two fundamental principles,—that no road be undertaken without at the same time providing for the eventual payment of loans incurred for its construction; and that crown lands adjacent to the road should be sold at a price that would repay these loans within twenty-one years.

This policy was lost sight of in the railway controversies following responsible government. During the fever of land speculation, settlers secured possession of crown lands before projected railways were authorized. But about 1877 Victoria inaugurated the practise of applying £200,000 annually from land sales to railway capital. In 1889 the New South Wales railway commissioner recommended that one-half the proceeds from the sale of crown land along proposed railways be devoted to paying the cost of construction. This has not been authorized by parliament, but on some recent lines the “betterment” principle has been applied by administrative regulation. Adjacent lands are assigned an increase of value according to their distance from stations theoretically ten miles apart.

In order to place the burden of possibly unprofitable lines upon those directly served rather than upon the whole community, laws have been passed in Victoria and Queensland making the local authorities partly responsible for the cost of branches solicited by them. These laws help the government to resist political pressure for

lines through districts where the traffic is not likely to pay interest upon the cost of construction.

The Victorian law on this subject, the Railway Lands Acquisition Act, was passed in 1893, but has since been amended. After parliament authorizes a line, and it is shown that the tax-payers along the proposed route desire its construction, the governor prescribes a railway construction district, covering the territory through which it passes, and may appoint a railway construction trust, composed of members of the local councils of the district. The trust is authorized to purchase such private lands as are required for the proposed railway. To do this, the trust borrows money on its own debentures from the state railway construction fund. This fund is derived principally from state railway loans. The trust must provide for the payment of its debentures, and may levy a special tax upon the real property of the district for this purpose. The land tax may vary in different parts of the district, "in proportion to the advantages or benefits appearing to accrue to the land by the construction of such line of railway." The sinking fund must be invested in Victorian public bonds. Construction cannot begin until the trust has conveyed to the state railway department a clear title to the lands required. The railway commissioners are required to charge local fares and rates upon the new line, and to keep a separate income and expense account of its operations, until the line pays working expenses and 4 per cent. upon its capital cost. Lines entirely within urban districts may be built either in this way or subject to a guarantee by the municipal authorities to make good to the government all deficits below working expenses and 4 per cent. on capital investment for a period of twenty years.

In 1895 Queensland passed a Railway Guarantee Act with general provisions not unlike those for urban branches

in Victoria. Local authorities in districts served by the proposed line obligate themselves to pay one-half the deficit in operating expenses and 4 per cent. upon the capital cost of the line for a term of fourteen years. The funds for this must be raised by taxation. When there is a surplus above aggregate operating expenses and 4 per cent. on the capital cost since the date of completion, one-half this surplus is returned to the tax-payers. If a line pays working expenses and interest for three successive years, the government may release the guarantors from their obligation. During the first ten years this law was in force only four short lines were built under its provisions. Three of these were non-paying.

In both Victoria and Queensland these guarantee acts contain very carefully framed provisions to prevent local districts from assuming the obligations without the consent of the tax-payers. The latter are in all cases allowed a chance to vote upon the question directly, and a clear majority must be shown in favor of obligating the district before the railway department is authorized to act further.

The conditions that caused the failure of early private railroads in Australia, especially the high cost of labor and materials during the gold excitement, also retarded public railway construction. In 1854 in all Australia there were but $2\frac{1}{2}$ miles of line open for traffic, and ten years later only 469 miles. During the following decade railways were built at the rate of about 100 miles per annum.

This slow rate of construction during the early years of railway building compared unfavorably with the enterprise shown by the United States and Canada. Sir Charles Dilke, writing of New South Wales and Victoria in 1867, said: "The want of railways is incredible. There are but some 400 miles of railway in all Australia, far less than the amount possessed by the single infant state of

Wisconsin. The sums spent upon the Victorian lines have deterred the colonists from completing their railway systems. £10,000,000 were spent upon 200 miles of road through easy country in which land cost nothing. The United States has made nearly 40,000 miles of railway for less than £300,000,000. Canada made her 2,000 miles for £20,000,000, or ten times as much railway as Victoria for only twice the money. Cuba has already more miles of railway than Australia."

The slow progress of the railways in the first decades of construction is ascribed by Coghlan to the difficulty of the government in obtaining funds. After 1874 progress was more rapid. By 1884 the total mileage was 5,855 miles, and this was nearly doubled ten years later. Since 1896 construction has been slower. The great era of railway building in Australia was between 1887 and 1889, when the average rate of construction was between seven and eight hundred miles per annum. In 1903, in the midst of a great drouth, the mileage slightly decreased. It was not until 1883 that Sydney and Melbourne, and 1886 that Melbourne and Adelaide were connected by railways. In 1889 the completion of a bridge over the Hawksbury River enabled connecting trains to be run from Adelaide to Brisbane.

The number of miles open in each colony by decades from 1871 is as follows:—

	1871.	1881.	1891.	1901.	1904.
New South Wales	358	1,040	2,266	3,107	3,362
Victoria	276	1,247	2,903	3,302	3,381
Queensland	218	800	2,320	2,903	3,030
South Australia	133	845	1,823	1,901	1,901
Western Australia	—	92	657	1,990	2,170
Tasmania	45	168	425	618	620
Total	1,030	4,192	10,394	13,821	14,464

These roads are of three gages. All the railways of Queensland, Western Australia, and Tasmania, 1,238 miles of the South Australia lines, and some branches in New South Wales and Victoria are narrow (3 feet, 6 inches) gage. The standard gage of New South Wales is 4 feet 8½ inches, and of Victoria 5 feet 3 inches. The South Australian lines from Adelaide to Melbourne and their branches (some 594 miles in South Australia) are the same gage as the Victoria roads.

This difference of gage is a great embarrassment to interstate commerce. It is necessary to transfer passengers and freight at the Queensland and Victoria borders of New South Wales. A similar transfer is necessary for freight passing from the narrow to the broad gage lines of South Australia, tho the inconvenience is less felt because these lines center in Adelaide. Conferences have been held for the purpose of adopting some method of securing uniform lines. It has been suggested that the wide 5 feet 3 inches gage of Victoria and South Australia be narrowed to the 4 feet 8½ inches standard of New South Wales and the narrow gage of Queensland widened, the expense being borne jointly by the railway systems of the states interested. The disadvantage of different gages would be peculiarly felt in time of war. Something of the cost involved in the transshipment of freight is indicated by the following junction charges at Albury, on the frontier between New South Wales and Victoria, for goods passing in either direction: live-stock, 2s. a truck; wool, 3s. 6d. a ton; wheat, 6d. a ton; all other goods, 2s. 6d. a ton.

Except for the break of gage the roads of South Australia, Victoria, New South Wales, and Queensland, form a connecting system. The railways of each state have been extended from its metropolis toward the interior and along the coast, the direction of development being determined by the desire to tap specific resources rather

than to reach interior markets. Long lines to inland pastoral districts have been built, partly to guard against the destruction of flocks in time of drouth.

The Queensland railways extend inland, perpendicularly to the coast, for three or four hundred miles, in three distinct systems. These lines lead directly to pastoral districts and are not interconnected, their only object being to make an outlet to the sea. There are also short railways penetrating the mountains to mining districts along the northern coast.

The lines of New South Wales spread out symmetrically from Sydney to the north-west, the west, and the south-west, in three systems. Originally the roads radiating from the Newcastle coal district were disconnected from those of the metropolis. The line to Bourke, upon the Darling River, extends directly westward 500 miles, reaching the remotest point from the sea attained in the state. The lines to the north connect with the Queensland railways, and a railway to the south connects with the Victoria lines at Albury.

Victoria is the best supplied with railway facilities in proportion to its area of any of the colonies. Many lines radiate from Melbourne. A north line connects with New South Wales, and a west line with South Australia. The object of the interior extensions, in this state, has been to reach the water traffic along the Murray and Darling Rivers, from which freight is drawn to Melbourne which belongs politically, if not commercially, to New South Wales and South Australia.

The South Australia railways consist of lines along the coast, through agricultural districts to the Murray River, and thence to the Victoria frontier, with a long narrow gage railway extending inland 834 miles to Oodnadetta. This road serves the pastoral districts of the interior, and a branch extending to the border of New South Wales,

and connecting with a private line at that point, taps the rich Barrier mining district of the latter state.

Western Australia, besides the trunk line from Albany to Perth and a private railway northward near the coast, has a short coast line south of Perth, between the mountains and the sea, serving a rich agricultural and forest district, and two long systems to the interior gold fields. These last lines pass over semi-arid country, have almost no local traffic, and one of them is paralleled for over 300 miles by a pipe line conveying water to the mines.

Two transcontinental railway projects are now before the colonies. In 1902 the South Australian parliament authorized a proposed north and south continental line 2,000 miles long through that state and the Northern Territory. This involves building something like 1,100 miles of light narrow gage track from Oodnadetta, the northern terminus of the present system, to Pine Creek, where it would connect with a short line already built to Palmerston on the north coast. It is proposed to grant one-half of the land in a strip 20 miles wide along the railway to the contractors undertaking its construction. On account of the aridity of the country through which the line passes, this land would have little value for agricultural purposes; but it might be used for scanty grazing. The main speculative value of such property would arise from mineral rights. On the other hand, the line presents few engineering difficulties except that of water supply. It is not the intention of the state to have this line operated by the builders, whose ownership would cease as soon as the land granted for its construction was transferred to them.

Another line, to connect the South Australian railway system with that of Western Australia which already penetrates the interior nearly 400 miles to Kalgoorlie, has been proposed as a federal undertaking.

Disregarding timber and mine railways not open to public traffic, the only state in which private lines have recently been built is Queensland, which has a new private railway, 102 miles long, from Maruba to Chillagoe. New South Wales has three short private lines. One, 45 miles long, was constructed under government permit in 1874. It runs through rich pastoral country to the Murray River, where it connects with the Victorian railways. It has been profitable, and used to pay 10 per cent. dividends. Another, 35 miles long, is from the important Broken Hill mining district to the western border of New South Wales, and connects with the South Australian lines. This railway paid as high as 70 per cent. dividends in 1891, and has recently been paying 20 per cent. Victoria has had no private lines of importance open to public traffic since 1878. In South Australia there were recently three private railways, all of trifling importance. Western Australia has the only private trunk line, 277 miles long. It is operated by the owners under government supervision. Tasmania still has 160 miles of private railway,—a relatively important fraction of her short system.

Mr. T. W. Coghlan, for many years chief statistician of New South Wales, is the authority for the following comparison of railway mileage in proportion to the population and area of different countries and of the two most important states of the Commonwealth:—

	<i>Population per mile of railway.</i>	<i>Area per mile of railway.</i>
Victoria	357	26
New South Wales	426	93
Australian Commonwealth	272	206
United States	358	17.5
Canada	285	191.8
Argentina	457	103.3

South Australia claims to have more railway in proportion to its population than any other country. In 1899 there were $53\frac{3}{10}$ miles of line for every 10,000 inhabitants, as compared with 26 miles in the United States.

Such comparisons are not of much significance, as mileage is not necessarily an index of railway service. Australia has tremendous areas of unsettled and largely desert country, not likely ever to be well populated. Hence in a comparison of railway facilities based upon the ratio of mileage to territory she makes a poor showing. On the other hand, with a population as widely dispersed as that of Australia, where less than 4,000,000 people are settled over an area approaching one-third that of the United States with 80,000,000 people, the needs of the country cannot be served without a mileage large in proportion to the number of inhabitants. But, under these conditions, railways are of light construction and narrow gage, with irregular or seasonal train service. The South Australian and Queensland lines, penetrating the interior for 500 and 800 miles, do not run daily trains, and at certain seasons there is a practical cessation of traffic over their rails.

Many lines have been built in advance of requirements. Political pressure is partly responsible for this. Rusden, the historian of Australia, says of the earlier period: "The facility of borrowing money in England to construct railways was largely availed of, at first with circumspection as to probable remuneration from traffic, afterwards with less calculation. Each district marshalled its forces to obtain lines. Ministerial necessities encouraged the demand. Loans afforded the supply. It was accepted by all that railways could only be constructed by means of loans, and every hamlet put forward a demand for its branch line. It was difficult to satisfy all, but vigorous efforts were made to win political support."

The result is that part of the railways of Australia do not serve a commercial need large enough to support them. The cost of constructing these roads has lessened the ability of the government to provide facilities in other sections where railways are really needed and are likely to be profitable. Economies that have been made necessary on all the lines have caused hardship to railway patrons.

However, in Australia there has been no wasteful construction of parallel lines in excess of traffic needs, and upon the whole the mileage is as well distributed as in this country or Canada. The Australian railways are now fairly adequate to the requirements of the country. With a uniform gage, more interstate connections, and the completion of the transcontinental lines, they would meet the reasonable needs of the present population and industries.

IV. ACCOUNTS AND STATISTICS, EXPENSES AND REVENUE.

The statistics of Australian railways are embodied in quarterly and annual reports laid before parliament by the railway departments. Those of different states are only partly comparable. For several years the commissioners, at their annual conferences, have tried to unite upon a uniform system of accounts, similar in a way to the uniform system of census statistics devised by the conferences of colonial statisticians. But these efforts have not yet resulted in fully comparable data of railway operations. And the earlier state reports do not present even approximately similar items.

Critics of government railway accounting in Australia have usually attacked the division of capital and income expenditures. In order to show more favorable results

from operation, railway authorities are said to have paid expenses from capital that properly should have been paid from earnings, thus lessening apparent deficits.

The desire to make future maintenance expenses as low as possible has caused some commissioners intrusted with the direct construction of railways to build them more solidly and expensively than immediate requirements justified. This method shifts legitimate operating expenses over to interest charges.

A serious tho not common fault in accounting has been to allow rolling stock, stations, and other permanent works usually maintained from income to depreciate, while still crediting them to capital at their full value. In 1902 a royal commission investigating the management of the Victorian railways found them credited with nearly \$2,500,000 worth of locomotives that had been discarded, and a general depreciation of rolling stock, amounting to \$7,852,513, unnoticed in the accounts.

On the other hand, in 1904 the commissioner of railways of New South Wales reported that during the previous six years the rolling stock of the tramways under his charge had been increased one-third from earnings.

There is room for honest difference of opinion as to the items to be charged to capital, and practise varies in different states. The commissioner of railways of Western Australia reported in 1902 that different classifications of capital account and interest charges, and of working and renewal expenses, made it impossible to compare the financial statistics of state railways. In Western Australia capital is charged with discounts and other costs of raising loans. How important an item in capital this may be is indicated by the fact that New South Wales has sold her railway bonds on an average for 96.45 per cent. of their par value. In Western Australia, again, so long as the department of public works built the railways, the

appropriations for the latter were charged with their share of the administrative expenses of that department. The commissioner estimated that this was thirty times what the railway department would expend under the same head if it constructed the lines directly.

The capital investment in Australian railways is sometimes confounded with the loans issued for their construction. But most of the states have paid part of the cost from revenue. Victoria has expended upon her roads something like \$19,000,000 from revenue sources, of which \$14,000,000 was derived from the sale of public lands. As long ago as 1892 New South Wales had expended upon her lines, from revenue, nearly \$25,000,000. In 1894 South Australia had spent upon her railways nearly two and a half million dollars from general revenue, and some \$58,000,000 from loan expenditures. In 1901 Western Australia had expended on its railway system \$2,000,000 from revenue and other sources, and \$33,000,000 from loans.

Some administrative expenses that in private railway operation are paid from income, in Australia are provided for from the general budget. Among such charges are the salaries of the commissioners and of the minister and the administrative expenses of the railway minister's office. In Victoria the pensions of employees are not paid from working expenses.

To secure accurate accounting, different states have passed laws and commissioners have provided administrative regulations governing railway book-keeping. To prevent the application of appropriations for capital to working expenses, Victoria requires a special act of parliament to charge the relaying of a track to the capital account. Such replacements of old works have been charged to capital in Western Australia, tho the practise is now discontinued. The provision, so frequent in Australian laws, placing construction of new roads in

charge of the commissioner of public works, a department independent of the railway authorities, has been dictated by the desire to prevent the application of appropriations for construction to other purposes.

Under the official regulations in Victoria no expenditure from capital is legal unless it has been approved by the commissioner in accordance with a prescribed form. In case of replacements, such as relaying tracts and rebuilding bridges, if the new work simply restores the railway property to its original condition, the entire cost is charged to operating expenses. If the replacements constitute improvements, such as relaying a track with heavier rails, or replacing a wooden bridge with steel or concrete, the cost is charged to capital, and working expenses are credited with the value of the old materials.

The apparent revenues of Australian railways are lessened by their performing, without charge, such public services as carrying government freight and government employees travelling upon official business. Railway materials imported by the states pay federal customs duties. State railways charge the federal postal authorities for carrying the mails.

In comparing the cost of building the railways of Australia with those of other countries, special conditions need to be considered. Early Australian lines were built in the midst of the gold excitement, when labor and materials were abnormally high. To build the first fourteen miles of railway in New South Wales cost six times the preliminary estimate for building 134 miles, or nearly a quarter of a million dollars a mile. The line was a suburban road near Sydney, presenting no engineering difficulties. Laborers from England were imported to complete it. Such extraordinary conditions not only checked construction at the time, but still record them-

selves in railway finance by raising the present average cost per mile.

New lines have been built at less expense, and, as economies of construction have been adopted for recent extensions to the distant interior, where only light traffic is expected, the investment per mile is reduced as the system grows. During the nine years ending with 1874 the cost per mile for all lines in New South Wales was lowered from \$93,564 to \$82,655. The capital cost per mile, in the two principal colonies and in the United States, was as follows for the two dates mentioned (Coghlan's figures):

	1874.	1904.
New South Wales	\$82,655	\$62,731
Victoria	102,896	59,330
United States	60,965	62,386

The greater cost in Victoria in 1874 was due to the fact that the colony had extended its railways rapidly in the early days of expensive construction. But the decrease in capital investment per mile was equally remarkable in both colonies during these thirty years, while it was very slight in the United States.

High as was the cost of the early government railways, it was less than that of private lines. In Victoria the comparative cost of building and equipping was as follows during three years when private railways were still important in that state:—

<i>Year.</i>	<i>Cost of public railways per mile.</i>	<i>Cost of private railways per mile.</i>
1865	\$171,641	\$234,253
1866	173,059	241,747
1867	207,996	243,416

The average cost of railway construction for the entire Commonwealth is lessened by the fact that narrow gage and pioneer lines compose about one-half of its total

mileage. On the other hand, as no iron is mined and no steel made in Australia, all railway material must be imported, charged with heavy freight. Omitting these factors, the latest available figures in 1904 showed the average cost per mile of lines open for traffic to be as follows: Australia, \$47,670; Mexico, \$45,829; Argentine Republic, \$49,703; Cape Colony, \$50,453; Canada, \$60,390; and the United States, \$62,386. The expenditure in Australia was therefore lower than in any other of the countries mentioned except Mexico with its cheap labor. Such figures have only approximate accuracy,—for the definition of capital investment is very different in different countries,—but they indicate that the cost of railways in Australia has not been excessive.

As with cost of construction, so, in estimating the expenses of maintenance and operation, allowance must be made for the great variation of gages and of physical and traffic conditions on different Australian railways and on different portions of the same system. Where traffic is light, especially where trains are irregular and carry but small loads, the ratio of operating expenses to gross earnings is higher than where traffic is dense. This is especially true of Australia, since it is imperatively necessary to charge a low rate upon merchandise from remote interior districts, in order to make any industry profitable in those regions. Where rates are low under such circumstances, the ratio of operating expenses to gross earnings must be high. It costs as much to keep in repair the 800 miles of narrow gage line to Oodnadetta, with two or three light mixed trains a week over its northern half, as it would to maintain a line with daily traffic. It costs more to operate trains in this remote district, especially in proportion to the freight carried, than on lines near the coast. In Western Australia wages of railway employees are higher in the interior, where traffic is light, than on the

coast, where freight and passenger business is relatively heavy.

Another reason why the ratio of operating expenses to gross revenues might be high in Australia, as compared with countries under private ownership, is that these railways are not usually run to pay a profit on capital. The common policy is to afford railway facilities to the people for something less than actual cost, supplying the deficit from general revenues. This makes the gross income low, and consequently raises the proportion of that income used to operate and maintain the roads.

The railway authorities of all the states are required by law to charge maintenance to working expenses. This requirement, evaded occasionally in the past, is now generally enforced. Maintenance costs from a fifth to a fourth of the total expenditure from railway revenue. Climatic conditions, such as the absence of frost and of floods and snow blockades in most parts of the country, favor lower maintenance charges than in America.

In 1865 the ratio of working expenses to gross revenue was 65.60 per cent. in New South Wales and 45.72 per cent. in Victoria, as compared with 51.65 per cent. in Great Britain. In 1874 the same figures were, for New South Wales, 48.03 per cent.; for Victoria, 52.36 per cent.; for Great Britain, 55.60 per cent.; and for the United States, 63.60 per cent. The Australian figures were rendered more favorable by the high charges for railway service then possible in the colonies. Before the railways were built, team freighting had cost about 65 cents per ton a mile in Victoria.

At times operating expenses have increased abnormally through lax management. Roads become overloaded with employees, and expensive and unnecessary service is given that makes no adequate return in revenue. Such a period of high expenditure occurred in New South

Wales about 1888, when the ratio of working expenses to income reached 66.69 per cent. Five years later, under a reform administration, it was reduced to 56.58 per cent. without increasing railway charges. Similarly, during the three years ending with 1898, Victoria reduced its annual working expenses about \$1,000,000, tho 200 miles of additional line were in operation at the latter date.

In 1904 the ratio of working expenses to revenue for all the railways of Australia and for Canada and the United States was as follows:—

<i>Country.</i>	<i>Per cent. of income used for working expenses.</i>
Canada	70.25
United States	64.86
Australia	63.68

Average working expenses for the Commonwealth are increased by the high cost, in proportion to revenue, of working the narrow gage lines in the interior of Queensland, South Australia, and Western Australia. The average ratio of operating expenses to revenue in Tasmania is about 75 per cent.

The character of the traffic on Australian railways has varied at different periods, and presents great diversity in different states. In New South Wales and Victoria, passenger traffic was a main source of revenue so long as the lines were confined to the more densely settled districts in the immediate vicinity of the larger cities. Later, with the rapid extension of railways into sparsely settled pastoral country and agricultural districts opening for development, freight traffic attained a relative importance much greater than at the earlier period. Now, with the growth of settlement in the interior, passenger traffic again affords a relatively large proportion of the revenues.

V. RATES AND FARES, TRAFFIC CONDITIONS.

The distinctive feature of Australian passenger service in all of the states except Tasmania is the importance of suburban traffic, the natural consequence of the concentration of population in large cities. Altho a country of magnificent distances, the average passenger journey is something like one-third the average journey in the United States, or approximately ten miles as compared with thirty.

It is impossible to make a flat comparison of railway fares in Australia and America for three chief reasons. First, the Australian railways have two classes, for which separate coaches are provided. Second, there are different kinds of tickets for the same class, as for workingmen and for school children, and return, circular, and season tickets. Third, in Australia the large ratio of suburban to local and through traffic reduces fares.

The accommodation provided for first-class passengers on most of the Australian railways is about the same as on day coaches of the better class in the United States. My experience upon the railways of all of the states except Tasmania was that there is nowhere as poor accommodation as upon the many branch lines and local trains in the South and West and even in parts of New England. Nowhere are there as dirty cars as on some of our Southern railways. On the other hand, the Australian roads do not afford the comforts and luxuries of our through trains, and the sleeping-car service, while affording more privacy, is, upon the whole, less convenient. The direct first-class fare from Melbourne to Sydney, 581 miles, is 80 shillings, about \$16, nearly as much as the fare from New York to Chicago, almost double the distance. From Melbourne to Brisbane, over 1,200 miles, the fare is 160 shillings, about \$40. But in both these cases the return fares are

but one and one-half times the direct fare, and the second class, which affords very comfortable travelling, is 25 per cent lower.

In 1892 suburban passenger fares were lower in the vicinity of Sydney than of London. For typical 5-mile journeys the lowest London rate was 16 cents, the New South Wales rate 12 cents. For 10-mile journeys the London rate was 32 cents, and the New South Wales rate 24 cents. For typical 20 mile journeys, the lowest London rate was 66 cents, and the New South Wales rate 49 cents.

Freight traffic is so different in different states and on different branches within the same state that it is difficult to describe it more specifically than to say that it is confined largely to such commodities as minerals, timber, hay and forage, and wool. Wool is the most valuable in proportion to bulk, and in the pastoral states normally yields a large fraction of the freight revenue.

General merchandise, however, nearly always supplies a large part of the income from freight. In 1905 in New South Wales coal and shale furnished over 60 per cent. of the total freight tonnage; grain and flour, 8 per cent.; firewood, $3\frac{1}{2}$ per cent.; wool, something less than 3 per cent.; hay and fodder, over 2 per cent. The only one-fifth of the tonnage was general merchandise, this class, on account of the higher rates received per ton, furnished in the neighborhood of two-fifths of the freight revenue. In New South Wales, wool, tho affording relatively a small fraction of the tonnage, as early as 1876 paid more revenue than any other commodity.

In South Australia in 1907 about one-half of the tonnage was minerals, two-sixths general merchandise, and one-sixth grain. Wool afforded but little over one per cent. of the total tons carried. The receipts from minerals were about 35 per cent. of the total freight receipts, while those from general merchandise were about 45 per

cent. The South Australian lines carry more agricultural produce proportionally than any other state. One-third of the total freight (532,333 of 1,515,621 tons) is carried to and from the Barrier mining district of New South Wales. The total freight receipts of the colony were \$8,777,053, of which wool paid but \$154,930.

Western Australian traffic conditions are unique in that about one-half of the freight tonnage is supplied by timber and firewood. Ores, brick, limestone, and similar crude commodities furnish one-fourth the tonnage, and general merchandise less than 10 per cent. This condition results from an enormous territory, occupied by a sparse population devoted to mining and lumbering.

The following figures, in so far as they relate to the Commonwealth, are based upon Coghlan's correction of comparative railway statistics for 1904. They have been compared with similar figures for the United States in 1906.

COUNTRY.	Passenger Journeys.		Tons of Freight.		Per Cent. of Total Revenue from	
	Total.	Per Capita.	Total.	Per Capita	Pas-sengers	Freight.
New South Wales	33,792,689	22.6	6,656,759	3.4	41.98	58.02
Victoria	54,282,003	44.5	3,439,203	2.8	47.73	52.27
Queensland ¹ . . .	4,144,314	7.8	1,572,226	2.9	37.94	62.06
South Australia .	9,751,065	25.7	1,521,830	4.0	32.55	67.45
Western Australia,	10,225,976	40.1	2,281,764	8.9	31.06	68.94
Tasmania	814,483	4.5	418,701	2.3	46.52	53.48
COMMONWEALTH .	113,010,530	27.8	15,890,483	3.9	40.96	59.04
UNITED STATES ² .	797,946,116	9.5	1,631,374,219	19.4	26.64	70.78

This table indicates clearly the wide variation of traffic conditions between the United States and Australia and between different states of the Commonwealth. The

¹ Passenger journeys do not include travel on season tickets.

² Per cent. of revenue does not include certain undistributed receipts from operation.

average Australian makes nearly three times as many railway trips as the average American; but they are mostly upon suburban lines and for short distances. As the average trip in America is about three times as long as in Australia, the amount of passenger travel per capita is nearly the same in the two countries. Steam railways perform a large part of the street-car service in Melbourne, and this accounts for the large number of journeys per inhabitant in Victoria. The state now proposes to electrify these lines. Gold-fields traffic and the suburban travel between Perth and Freemantle increase the number of trips per capita in Western Australia.

The figures for freight traffic are even more important as illustrating comparative conditions of railway economy. The per capita freight tonnage of the Commonwealth is only one-fifth that of the United States. The grazing states have a lower tonnage than South Australia, with its larger share of agricultural produce and ores; and Western Australia, with its forest and mine resources large in proportion to population, has half the per capita tonnage of America. This fact needs to be remembered in connection with another to be mentioned later,—the Western Australian railways are the only lines that have regularly paid interest on their capital during the last decade.

Passenger and freight service are opposed to each other in Australia in that for the former short hauls and for the latter long hauls pay the lower revenue. Passenger traffic pays a larger per cent. of the total railway income in Australia than in America.

Compared with America, the average haul in Australia is short, and the average train load light. The following table gives comparative train loads in the United States and in the only two states of the Commonwealth whose railway reports afford these figures:—

	1901.	1902.	1906.
United States	294.70 tons.	308.19 tons.	344.39 tons.
South Australia	75.42 "	69.08 "	89.94 "
New South Wales	69.40 "	66.30 "	— "

In 1906 the average haul in the United States was 132.33 miles, as compared with 117.41 miles in South Australia. In 1904 the average haul in New South Wales was but 60.7 miles. This was partly due to the very short haul—17.47 miles—of coal, which furnishes 60 per cent. of the freight tonnage of that state.

The smaller train load in South Australia is partly accounted for by the narrow gage. But lighter trains and shorter hauls, as compared with the United States, are due primarily to the concentration of population and industries in the coastal districts for climatic reasons, combined with scanty traffic through the sparsely settled interior. The uneven distribution of business that results, both along the same line and in different parts of the country, should not be charged, as is sometimes done, to the administrative policies of the railways, but to natural conditions that cannot be modified by railway management.

The same conditions account for the relatively denser traffic in the United States. The number of tons hauled a mile for every mile of railway open is in South Australia 130,928, in New South Wales 139,669, and in the United States 982,401. The average density of traffic is probably at least seven times as great in our own country as in the Commonwealth.

Freight rates in Australia are determined by different considerations than prevail in the United States. There are several important reasons for this. First, in Australia competition does not exist for the same haul as it does in America. There is less inland water competition. But acute competition exists, as will presently be shown,

for the freight of certain districts between the railway systems of different states. Second, railways are not built and administered primarily for earning revenue, but for public utility, and rates are in theory adjusted in accordance with a policy of general welfare. They are supposed to pay operating expenses for the particular haul in question, but on different commodities and between different points are adjusted to promote the settlement of public lands and to develop industries. In the third place, Australian rates are subject to modification on account of political or popular pressure to a greater extent than in America. There is a constant struggle between the state railway departments endeavoring to reduce deficits and merchants and producers endeavoring to reduce rates.

VI. INTERSTATE COMPETITION.

While competition for the same haul is impossible, because there are no parallel lines of importance in Australia and no private lines competing with those of the government, competition between different state systems has been troublesome. It is associated with river competition, and exists along the borders of Queensland, New South Wales, Victoria, and South Australia. This competition has caused the most serious rate problem that the railways of these four states have had to meet. Originally the interior pastoral districts of South-east Australia were served exclusively by river steamers and barges plying the Murray and Darling Rivers and their tributaries. This brought the traffic of those districts to South Australia. The object of the Victorian railways, after supplying the immediate need of the gold fields around Ballarat and Bendigo, was to reach these rivers, one and two hundred miles from Melbourne, and divert part of the

river-borne traffic to that city. Melbourne was thus enabled, about 1870, to secure a considerable proportion of the New South Wales wool clip, diverting it at that time almost solely from South Australia. After New South Wales had extended her railways to the interior, so that they tapped the same region as the river system, competition, which already existed between Victoria and South Australia, was increased by this new rival. The interests at stake were more than mere freight revenues. The business of supplying the pastoral districts with merchandise, commissions for handling their wool, and banking profits from wool and ranch loans were all involved, and were a basis for the bitter commercial rivalry between Melbourne and Sydney. Victoria had the advantage of possession and a shorter land haul from the river districts. From the Murray it is approximately twice as far to Sydney as to Melbourne.

Interstate competition first made itself felt as influencing rates about 1870, when Victorian railways began to pay a commission of 12 cents a bale to merchants bringing 10,000 bales or more of New South Wales wool over their line. In 1874 the railway commissioner of New South Wales noticed this competition in his report. He published figures to show that, tho New South Wales had more than twice as many sheep as Victoria, the Victorian railways carried more than two and one-half times as much wool as did those of New South Wales. The railway revenue from this commodity was over \$250,000 in Victoria and less than \$145,000 in New South Wales. He urged railway extension to secure this trade and give the lines the advantage of back-loading to the pastoral districts. Victoria had already made reductions in its rates for the purpose of attracting freight to its borders, away from the South Australian rivermen. The value of products crossing the Victorian border from New South

Wales had nearly doubled between 1872 and 1874, and was considerably over \$20,000,000 the latter year. The following year the commissioner noted the competition between South Australia and Victoria. The river traffic at this time employed 40 steamers and 50 barges over 3,500 miles of navigable water.

Since the New South Wales railways reached the border, this competition has been more keen. In order to attract New South Wales traffic, Victoria has had as many as six tariffs for the same commodity from the same station, based upon the origin of the goods. Merchandise to New South Wales and wool from New South Wales were carried at much lower rates for the same distance than were goods consigned to Victorian consumers or wool produced upon Victorian ranches. For instance, from Melbourne to Echuca, $144\frac{3}{4}$ miles, sugar consigned to a Victorian consumer paid \$13 a ton freight. For the same haul, if consigned to a distant ranch in New South Wales, upon the Darling River, it paid but \$3.28 a ton freight. If for an intermediate destination, it paid all the way from \$5.48 to \$11.80. The cost of carrying Victorian wool from Echuca to Melbourne was \$6.20; and several shillings lower if from points beyond the state, according to the distance of the respective stations from the border. The percentage of discount on the regular Victorian rate from the border varied from 46 per cent. to 66 per cent. New South Wales especially resented having Victorian railways draw freight from the western districts, because Victoria had adopted a protective tariff that excluded New South Wales merchandise, and prevented Sydney merchants from competing for Victorian trade.

Similar conditions existed on the Queensland frontier. In this case New South Wales, with the advantage of a shorter haul, was able to take wool from the Queensland ranches. Consequently, the parliament of the latter colony

passed a "Railway Border Tax Act" in July, 1893, stating in the preamble that the state of Queensland had taxed itself to build railways and harbors and to subsidize steamship lines to carry its produce to other countries, and that these commodities had been diverted to another state by differential rates. An export tax of \$12.17 a ton was therefore levied upon all station produce crossing the border.

The hostility between the states caused by railway competition was a serious obstacle to federation and a delicate question in the federal convention. The proposal to have the Commonwealth take over the state railways having failed, partly because the assumption of state railway debts by the federal government presented many difficulties, the constitutional convention tried to devise some means of regulating interstate commerce. Members asserted that, as the first object of federation was to secure free trade between the states, the regulation of railway rates by the central authorities was essential. They claimed that there would be no advantage in a federation that simply transferred commercial contests between the states from the custom-house to the railway station. Most of the delegates were agreed that there should be an interstate commerce commission with judicial powers and some authority to regulate rates. Two parties arose in the convention over the question of the limits of this power. The New South Wales representatives took a states' rights attitude, and stood out for limiting the power of the commission under the constitution to regulating rates upon merchandise actually crossing the border. Against this position, Victoria and South Australia, with some support from other colonies, took the ground that a rate imposed by a state upon traffic entirely within its borders might become practically an interstate rate, if it were so adjusted as to divert traffic, that would naturally

pass across the border, away from a point within another state. In a word, the Victorian and South Australian delegates, actuated by motives of self-interest, advocated giving the federal government power to enforce an economic rate; that is, a rate that would allow traffic to flow through its "natural channels." So distrustful were the New South Wales delegates of this proposition that, when a motion was carried to give the federal parliament a free hand with the subject, they considered that this might render the adoption of the constitution by New South Wales impossible. The New South Wales delegates claimed that their railways were forced to apply what were practically discriminating rates to all commodities from the interior of the state in order to secure freight for their lines. Without this freight the lines would be non-paying, and thereby a great financial loss would be imposed upon their people. The matter was finally compromised by providing an interstate commission, under act of parliament, to regulate railway tariffs, but requiring the federal government to give due regard to the financial responsibility of the states with respect to their railways, and expressly allowing the states to make development rates for purposes of opening territory, provided these rates applied equally to traffic originating within and without the state. Up to within a year, tho two propositions for establishing the interstate commission have been made in parliament, no action providing for one has been taken.

It has never been possible to settle interstate railway competition in accord with railway interests alone. In 1895 the railway commissioners of New South Wales, Victoria, and Queensland, came to an agreement. New South Wales was not to reduce her existing rates. Victoria and South Australia pooled their Darling River traffic upon a basis of two-fifths and three-fifths of their respec-

tive receipts after deducting 25 per cent. as a working charge. These two colonies established eleven base rates to points in New South Wales, with proportionate mileage rates to other stations. This enabled them to increase their previous charges, and they agreed to pay 40 per cent. of the increase to New South Wales. The three colonies agreed to abolish certain differential rates. This agreement was disallowed by the Victorian government at the instance of the Melbourne merchants. It might have increased the profits of the Victorian railways, but it would have adversely affected the business interests of the metropolis.

As the federal government had not settled competitive rates, a new voluntary agreement of the railway commissioners of New South Wales, Victoria, and South Australia, became effective on March 1, 1905. The provisions were in substance that the rates on traffic to or from competitive districts should be public, that no special rebates or concessions of any kind should be given to secure such traffic, and that all preferential rates which could be considered as inconsistent with the provisions of the federal constitution should be abolished.

This agreement indicates that federation has not ended interstate railway competition. It was stated in parliament that cheese shipped to Broken Hill from Adelaide, if it came from other states, paid \$22.39 a ton. If it was a product of South Australia, it paid \$8.15 a ton. Likewise the freight upon bacon from other states between Adelaide and Broken Hill was \$27.84 a ton; while that upon bacon made in South Australia was \$8.15 a ton. Even the agreement of 1905 has not prevented discrimination against freight originating in another state. In testimony before the tariff commission in 1906 a manufacturer stated that, in order to get harvesters from South Australia to a point in Victoria just over the border

from his own state, he was obliged to ship by sea to Melbourne and then via the Victorian railways almost as far as the direct railway distance from his factory to destination.

VII. RATE THEORY AND PRACTISE.

The federal convention afforded an opportunity for a public discussion of rate theories, and revealed much diversity of views as to what constituted a fair railway policy. The partisans of economic rates—those favoring the shortest haul—encountered opposition. One delegate said, “I do not allow for one moment that because it is a shorter distance from a certain point to Melbourne trade should go in all occasions to that city.” Mr. Deakin, the present premier of the Commonwealth, who favored federal ownership of railways, contended that the government should require equal rates for equal mileage, except where the cost of operation was less on account of some such favorable condition as the vicinity of coal fields. He would make an exception in favor of tapering rates to develop remote districts. Some of the delegates maintained that no rate was preferential unless freight was carried at a loss. The convention was quite unable to distinguish to its satisfaction between differential and preferential rates. The difficulty was partly due to a theory of state railway management that does not exist under private ownership. This theory was stated by Mr. Reid, later federal premier, in the following words: “The state, owning an enormous quantity of land, has, as a representative of the whole community, a strong, even an imperative reason for railway construction, which has nothing to do with railways from the strict business point of view. . . . A railway that might, for a course of years, show a heavy loss, . . . might have con-

ferred untold advantages on the whole community in many directions. All these elements have to be taken into account by a state that runs railways, and which is at the same time responsible for the good government of its country and the development of its territory."

Tapering rates—a lower charge per mile for a long than for a short haul—were adopted many years ago. The early coal rates in New South Wales were four cents a ton a mile. In 1863 the commissioner allowed a discount of one mile in fifteen on all distances over fifteen miles. In 1876 the discounts for all freight were 10 per cent. per mile for hauls over 100 miles, 20 per cent. for hauls over 150 miles, and 40 per cent. for hauls over 200 miles. The earlier system of charging for wool by the bale-mile was changed about the same time to a station rate per bale.

In 1893 the railway commissioner of New South Wales mentions the following "development rates": grain in six ton lots (carloads), 300 miles for \$3.41, 400 miles for \$3.71, and 600 miles for \$3.95. Wool was carried from Nyngan to Sydney, 377 miles, for \$18.50 a ton. From Bourke and all points on the same line not more than 100 miles nearer Sydney there was a flat rate of \$19.53 a ton. These hauls ranged from 400 to 500 miles. Development rates are usually thus based on what are called in Australia station rates; that is, rates to specific points, which are lower than mile rates. Such a rate is not a basis for graduated rates between the station and tide water, but is a maximum rate. The flat rate for points 50 or 100 miles nearer the sea than the basing station may not be lower than the station rate.

Mile rates are based on the tapering principle. This is shown in the following table, which gives the present rates in three states for wheat and for the lowest-priced and highest-priced class of freight for hauls of 100 to 500

miles. The figures are the rate per ton-mile in decimals of a cent (United States currency).

		Per Mile for a Haul of				
		100 Miles	200 Miles	300 Miles	400 Miles	500 Miles.
Wheat	{ New South Wales	1 95	1 33	1 00	81	68
	{ Victoria	2 03	1 54	1 14	91	74
	{ South Australia	2 12	1 56	1 38	1 29	1 26
Lowest Class Freight	{ New South Wales	2 83	2 43	2 15	1 87	1 68
	{ Victoria	3 63	2 93	2 51	2 30	2 16
	{ South Australia	2 79	2 16	1 94	1 84	1 78
Highest Class Freight	{ New South Wales	13 33	12 24	10 70	8 78	7 82
	{ Victoria	14 70	14 21	13 32	12 67	12 33
	{ South Australia	12 66	11 91	10 90	10 13	9 04

New South Wales development rates are subject to the suspicion that they are partly competitive. The Western Australian lines have no competition, nevertheless development rates are imposed. Mining machinery, native coal, and timber are carried at about cost.

The objection to development rates is that they increase freight charges for producers near the metropolis in order to benefit those at a distance. This was urged repeatedly in the federal convention. One speaker said that, while producers in the river districts gained by the low rates, the cost was paid by those who used railways in other portions of the colony. Another speaker said, "The governments give with one hand to some of the producers what they take away with the other from other producers."

In one of the New South Wales reports the commissioner observed that rates had been revised so that shippers living within a short distance of Sydney were no longer paying more for freight to or from that city than producers much further away. In 1902 a royal commission in Victoria reported that rates were so high in some places

that freight was hauled by wagons in competition with the railways, while in other places the rates were so low that freight did not pay the cost of carriage.

Changes in freight tariffs are about as frequent in Australia as elsewhere. Between 1858 and 1875, 20 rate sheets were published in New South Wales, or more than one a year. Revisions occur with less frequency now than at an earlier period, because economic conditions are not changing as rapidly. The last passenger and freight rates in my hands from New South Wales went into effect in 1904, those from South Australia in 1907.

Freight tariffs are changed not only to suit the convenience and varying necessities of the railways, but also in response to political or popular pressure. This is occasionally mentioned in official reports. In 1899 the Victorian commissioner stated, if he had yielded to the demand made upon him for additional train services and lower rates, the revenue would have been lessened £200,000 annually. In 1904 the railway commissioner of Western Australia, after noting certain reductions made during the preceding year, said: "If our rates (which are practically the same as in the eastern states) are to be lowered, owing to the persistency of merchants and others, the paying or non-paying of the railways becomes a responsibility of the state."

Little enlightenment is to be gained from studying the tariff books of Australian railways, unless all the conditions surrounding the traffic of each point are taken into consideration. There are usually six classes of freight, besides which wool, grain, minerals, and similar commodities are given special rates. The tariff for each class is based upon mileage or upon a flat rate to a district or station. The district rates are not necessarily to competitive points. For instance, there is such a rate on certain classes of freight to Ballarat from Melbourne,

somewhat lower than the mileage charge. Classifications and district rates may conceal discrimination in favor of local commodities. In South Australia American leather and cloth are rated in class 3, paying the highest mileage rate of any article; while ordinary leather and cloth are in class 1, paying about \$2.25 less a ton for a hundred miles.

Australian railways conduct their own express business under a parcel stamp system. The rates are based upon weight and distance. In New South Wales to carry 3 pounds 150 miles costs but 12 cents; to carry 112 pounds the same distance costs \$1.46; to carry 3 pounds 500 miles, 37 cents; and to carry 112 pounds the same distance, \$3.16. Victorian parcel rates are slightly less for short distances and more for long distances than those of New South Wales.

There has been a constant reduction of rates in all the colonies. In New South Wales the average receipts from representative commodities per ton a mile were as follows for the years indicated:—

Year.	Coal. (Cents.)	Grain and Flour. (Cents.)	Wool. (Cents.)	General Merchandise. (Cents.)
1879	2.54	2.58	5.60	5.38
1885	1.64	1.66	4.53	4.97
1893	1.46	1.28	5.03	5.23
1905	1.24	.87	3.63	3.45

These figures do not include terminal charges.

The average haul for these commodities is as follows: coal, 17.5 miles; grain and flour, 141.0 miles; wool, 271.3 miles; and general merchandise, 118.7 miles. The reduction in average receipts per ton has been even more marked than in case of the single commodities just mentioned, on account of the great increase of mineral traffic.

The difficulty of comparing the freight rates of Australia with those of any other country is illustrated by the wide diversity of rates in different states. In 1893 the rates for grain and flour for 100 miles were as follows in the four colonies mentioned: New South Wales, \$1.95; Victoria, \$2.20; South Australia, \$2.65; Queensland, \$3.34.

In 1893 the New South Wales railway commissioners, in a public reply to unfavorable comparisons between the colonial lines and those of the United States, contrasted the traffic conditions of the two countries, such as density of population, average haul, and average train load. They pointed out the fact that the short ton was used in American railway statistics and the long ton in those of Australia. They called attention to the lack of back-loading in Australia and to the relatively larger proportion of small consignments in their total freight. They stated, however, that the rates for grain and other agricultural produce for long distances "are as low as they are in America." This claim was probably true for many hauls of equal length in the two countries, tho it must be remembered that what is a long haul in Australia is a comparatively short one in the United States. In a comparison made two or three years ago I found that a local wheat rate from Fergus Falls, Minnesota, to St. Paul, 187 miles, was about double an Australian rate for the same distance. Likewise for hauls of equal length a number of rates upon coal, fruits, packing-house products, and other commodities, were higher in America than in some of the states of the Commonwealth. Yet the large amount of long haul competitive traffic in the United States necessitates, and our better-built trunk lines and greater train capacity render possible, such low rates for many commodities over such long distances, as compared with those of Australia, that the average charge per ton-mile is but a fraction of that in the Commonwealth. American railways re-

ceive upon an average .766 cent for carrying a ton of goods a mile, those of New South Wales 2.172 cents, and those of South Australia 2.77 cents. As the rates are still higher on some of the other Australian lines, the average freight charge in the country is probably four times that in the United States.

VIII. FINANCIAL OUTCOME.—PROFIT AND LOSS.

In America we are so apt to regard railways solely as commercial enterprises that questions of profit and loss appear more important to us than they do to Australians. The Australian attitude towards railway deficits is about the same as our own towards deficits in the postal service. Most railways in Australia failed to pay much more than operating expenses until the lines reached the interior marketing points. About 1880 those of South-eastern Australia attained a degree of development that returned the maximum profit to the state. The long lines to the interior had not yet been built, interstate competition was more moderate, and traffic was able to bear fairly high charges. In 1881 the railways of New South Wales paid 5.31 per cent. and those of Victoria 4.04 per cent. upon their capital. But during the decade ending with 1904 the only state regularly paying a net profit above operating expenses and interest charges was Western Australia. The light railroads of this colony had encountered few engineering difficulties, and received the benefit of the great expansion of population and industry due to the recent gold discoveries. During these ten years the only other states at any time paying a net profit were New South Wales, which did so twice, and South Australia once. While the South Australian lines seldom pay a profit, their deficits are very small, being less than one per cent. upon the capital every year of the ten, with a

single exception. Tasmanian railways are worked under peculiarly unfavorable natural conditions; and, tho rates are higher for the same service than on the mainland, the annual deficit varies from slightly over $1\frac{1}{2}$ per cent. to nearly $3\frac{1}{2}$ per cent. upon the capital invested. Queensland, during the decade mentioned, had a deficit varying from .88 per cent. to 2.44 per cent. upon its capital.

The aggregate deficits in some states amount to startling sums for young and sparsely settled colonies. During the 23 years ending with 1875 the aggregate interest on the railway debt of New South Wales was £4,536,073, while the net earnings for the same period were but £1,870,127. The deficit, therefore, was £2,665,943, or considerably over half a million dollars a year. The aggregate deficits in Victoria from 1890 to 1904, inclusive, were over four million pounds, or something like \$1,300,000 per annum. In 1904, on the other hand, Western Australia had a profit of about \$550,000 over all expenses, including interest upon its entire railway capital both from loans and revenue.

In 1904 the total railway debt of the Commonwealth was £131,930,000, about \$642,000,000, or 57.96 per cent. of the total public debt of the states (over sinking funds). The railways were paying in that year 3.08 per cent. on the cost of construction. They had paid something less the previous two years. The net deficit for the Commonwealth, after including interest charges, was as follows for the years stated: 1900, .59 per cent.; 1901, .65 per cent.; 1902, .86 per cent.; 1903, in the midst of the drouth, 1.22 per cent.; and in 1904, .67 per cent. The average annual deficit during these five rather unfavorable years was therefore about \$5,136,000.

Two causes account largely for these deficits. Rates on all lines are kept down by popular demand and in order to make the railways subservient to development. For

the same reasons non-paying lines and branches are constructed. Non-paying railways have been built in the United States, and in some cases abandoned. But in a country where railways are owned by private companies the capital of a bankrupt or abandoned line disappears from commercial accounts, and the loss is pocketed by the investors. Under government ownership, interest upon this unprofitable investment continues a permanent charge against the existing railway system. In 1903 there were twenty-five non-paying lines in New South Wales, representing an investment of over \$65,000,000. Unprofitable lines in Victoria are operated at an annual loss of nearly a million and a half of dollars (£294,697).

The recent prosperity of Australia has changed most of these deficits to profits. Within the last few years the railways of Victoria have met their interest charges, and in 1907 the South Australian railways had a surplus of over \$1,000,000. The Queensland railways, also, are now reported to be self-supporting. These better financial results are due to favorable seasons and the high prices for wool and meat which Australia at present enjoys; but there is reason to believe that the period of serious deficits is well-nigh over. Unprofitable lines are less likely to be built than formerly, as the bad economy of this policy is now well understood. The rates of interest upon public loans become lower as the early railway debt is paid or refunded. Victoria paid 6 per cent. for most of the money borrowed for railway construction prior to 1870. South Australia paid 6 per cent. upon all its loans during this period, and has not paid over 4 per cent. for money borrowed since. The last reported loans have been made for as low as 3 per cent. and $3\frac{1}{2}$ per cent. Were the entire debt refunded on this basis, the South Australian railways would seldom have a deficit, as their average earnings are rather over $3\frac{1}{2}$ per cent. upon their investment.

IX. CONCLUSION.

Statistical comparisons of the adequacy, economy, and efficiency of Australian and American railways are to be distrusted. Even in the rare instances where we may feel assured that figures mean the same thing in both countries, we are met by the fact that they must be qualified by a multitude of considerations relating to the different purpose of the railways under government and private ownership and the different physical conditions under which they operate. Merely descriptive comparison is fairer, though superficially it may appear less accurate. Considering the small population of Australia and its distribution over so vast a country, the railways are probably as extensive as could well be expected, altho the total mileage is so far behind that of our own country. The service maintained is not perfect, but is fairly satisfactory. The passenger service impressed me as considerably better than in some of our western and southern states where physical and industrial conditions were not dissimilar from those of the Commonwealth. Shippers in Australia often criticise details of traffic management, but a general criticism of the railway administration is rare. There is so little opposition to government ownership that a person who seriously proposed returning to private control of railways would be considered decidedly eccentric.

Nevertheless, it does not follow that because government ownership has been successful in Australia it could be applied as easily in the United States. Public ownership was a necessity to which Australia was forced to accommodate itself, not a goal toward which it was ardently striving. Before methods of public administration were perfected to the extent that they are to-day, great evils in railway management arose, and the present

comparative efficiency of the government lines results from experience gained through a multitude of failures.

The essential process of railway administration is the same under an independent government commissioner or board of commissioners in Australia as under a general manager and board of directors chosen by the stockholders in America. There is no reason why one system should not be as efficient as the other. The railway commissioner has the same authority as the president, directors, and managers of an American railway. He uses independent judgment to the same extent in details of management. In both countries, success or failure depends upon the man in control. In Australia the position of a railway commissioner is secure and well paid. There is no difficulty in obtaining competent men. The salary of the commissioner or chief commissioner is \$15,000 or \$20,000 a year in the larger states; and, tho he is appointed for a fixed term, his reappointment is practically certain so long as the roads are well managed.

For many years there has been no charge of railway favoritism to individual shippers. The evil of secret rebates, except possibly where states compete against each other, is practically unknown. Railways have not fostered trusts. But these results are due to the fact that the railways of each state are a monopoly, not to government ownership.

Railway employees constitute a large fraction of the voting population, and possibly have used their political power at times to favor their own against the public interest. But under the present organization, which renders the commissioner independent of politics, their political influence does not affect the management. Recently, in Victoria, all public employees, including railway servants, have been represented in parliament by separate members, in order to prevent their holding the balance of

power in so many election districts as practically to control the legislature. In the two railway strikes of importance that have occurred since 1900 the public has vigorously supported the government against the strikers. Public interest in efficient railway service is too keen to allow employees to usurp improperly functions of administration.

While the wages of railway employees are higher in some parts of the United States than in Australia, the general condition of workers is undoubtedly better in the latter country. Their tenure of service is more secure, they work shorter hours, usually eight or nine per day, and in two states, Victoria and New South Wales, they retire upon a pension. These conditions have not prevented serious strikes in Victoria and Western Australia, and in the former state there has been very drastic legislation to suppress these disturbances.

It has been asserted that the rate policy of government railways in Australia has been dictated by the commercial interests of the great cities, and caused the population to become concentrated in a few large centres. The latter assertion makes an effect of a cause. When the first railways were built in Australia, one-third of the population of Victoria already resided in Melbourne, and one-fourth that of New South Wales in Sydney. But the existence of these large cities, though due to other causes, has influenced the rate policy of the government. Urban rivalries are behind the keen interstate competition. At interior towns, such as Ballarat, Bendigo, or Bathurst, one hears the complaint that local manufactures are crippled and country trade hampered because they cannot obtain the same rate privileges as the metropolis.

Complaints of car shortage and delays in transporting freight are less common than in America, but this is because the Australian railways have only about one-seventh

as much work to do per mile of line as those of the United States. For the traffic they handle the railways of the Commonwealth are in a sense more adequate than our own; but this results from the physical peculiarities of the country, which require a large mileage in proportion to business on account of the nature of the industries to which the service is limited and the absence of through freight. To complete the circle of reasoning, private enterprise would hardly have provided railways at all under these disadvantages.

The evils predicted of government ownership in the United States are not now apparent in Australia. Each country has probably followed the policy best adapted to its circumstances. To change that policy in response to a theory would be unwise. If industrial conditions change in America in such a way as to demand government ownership, it will doubtless come. But in the United States of the past private railway control was inevitable because it responded to our peculiar needs; while in Australia, for the same general reason, government ownership was an economic necessity.

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